Application Number 10/617,455
Responsive to Office Action mailed August 11, 2005

REMARKS

This amendment is responsive to the Notice of Non-Compliant Amendment dated January 10, 2006. This amendment meets the requirements of 37 CFR 1.121. Applicant has amended claims 1, 16, and 18 and added new claims 30 and 31. Claims 1-31 are currently pending.

Claim Rejection Under 35 U.S.C. § 103

Claims 1-3, 5-7, 9-12, 14, 15, 18-20, 22-24 and 26-29

In the Office Action, the Office rejected claims 1-3, 5-7, 9-12, 14, 15, 18-20, 22-24 and 26-29 under 35 U.S.C. § 103(a) as being unpatentable over Regan (US 6,407,736) in view of Deering (US 2003/0122815). Applicant respectfully traverses the rejection to the extent such rejections may be considered applicable to the claims as amended. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention.

Regan and Deering fail to disclose an apparatus comprising a rendering engine that defines a rectangular area of pixels that bounds a triangular area of the pixels, selects a line of pixels within the rectangular area of pixels, sequentially evaluates coordinates associated with the pixels of the line of pixels to determine whether the pixels fall within the triangle area, and ceases evaluation of the coordinates associated with the pixels of the line of pixels upon determining that at least one pixel of the line falls within the triangle area and a current pixel no longer falls within the triangle area, as recited in Applicant's amended independent claim 1.

Regan and Deering also fail to disclose a method comprising computing data that defines a rectangular area of pixels that bounds a triangular area of the pixels, selecting a line of pixels within the rectangular area of pixels, sequentially evaluating coordinates associated with the pixels of the line of pixels to determine whether the pixels fall within the triangle area, and ceasing evaluation of the coordinates associated with the pixels of the line of pixels upon determining that at least one pixel of the line falls within the triangle area and a current pixel no longer falls within the triangle area, as required by Applicant's amended independent claim 18.

Regan does not disclose or suggest sequentially evaluating coordinates associated with the pixels of a line of pixels to determine whether the pixels fall within the triangle area and

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ceasing evaluation of the coordinates associated with the pixels of the line of pixels upon determining that at least one pixel of the line falls within the triangle area and a current pixel no longer falls within the triangle area. In fact, the Office concedes that Regan fails to explicitly teach evaluating coordinates associated with pixels of the rectangular area to selectively render the pixels that fall within the triangular area. Office Action, page 2.

Deering provides no teaching sufficient to overcome the basic deficiencies in Regan. Deering describes a process in which the Deering system defines a rectangular box enclosing a triangle area and determines whether each of the sample positions within the rectangular box reside within the triangle area. Page 13, [0184]. In other words, the rendering unit in Deering determines whether all of the sample positions within the rectangular box reside within the triangle area.

The rendering methods and devices described by Regan and Deering are fundamentally different from the subject matter defined by the claimed invention. According to Applicant's claims 1 and 13, the evaluation of the coordinates associated with the pixels of the line of pixels to determine whether the pixels fall within the triangle area ceases upon determining that at least one pixel of the line falls within the triangle area and a current pixel no longer falls within the triangle area. In this manner, Applicant's invention, as claimed in claims 1 and 13, *does not evaluate the coordinates associated with all the pixels within the rectangular box*, only a portion thereof. As one example of Applicant's invention, FIG. 2 illustrates an exemplary method of rendering using a top-down, left-right approach in which the rendering engine evaluates coordinates associated with pixels of the pixel line until it is determined that a pixel exits the triangular area. See FIG. 2 and [0033].

Moreover, Regan and Deering fail to disclose or suggest the requirements of Applicant's dependent claims. For example, Regan and Deering fail to disclose or suggest computing a coefficient matrix for computing linear coefficients for a set of linear equations for computing edges of the triangle area and applying the coefficient matrix to the pixels to determine whether each of the pixels falls within the rectangular area, as required by Applicant's claims 3 and 20. On the contrary, Regan describes use of matrices to solve for coefficients for a z-plane equation. Col. 29, ll. 38-44. The Regan system uses the z-plane equation to obtain accurate z depth information at various points on the triangle. Col. 29, ll. 64-66. The Regan system also uses the z-plane equation to generate span information so that the system can determine whether a

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particular pixel location for which the various scan-out operations are being performed is inside or outside the relevant triangle. Col. 29, l. 66 – Col. 30, l. 4. The "span" information identifies the left and right edges of the triangle intersected by that row/scanline, z depth information for the current pixel being processed on that row/scanline, and "dz slope" information which indicates the slope, or change in z depth, of the triangle from left to right. Summary, ll. 35-42. In other words, the z-plane equation is simply used to calculate the z depth information for the current pixel and not whether the current pixel is inside or outside the relevant triangle. Moreover, the z-plane equation is exactly that, an equation not a matrix. Thus, Regan does not disclose computing a coefficient matrix for computing linear coefficients for a set of linear equations for computing edges of the triangle area and applying the coefficient matrix to the pixels to determine whether each of the pixels falls within the triangular area.

For at least these reasons, the Office has failed to establish a prima facie case for non-patentability of Applicant's claims 1-3, 5-7, 9-12, 14, 15, 18-20, 22-24 and 26-29 under 35 U.S.C. § 103(a). Withdrawal of this rejection is requested.

Claim 13

In the Office Action, the Office rejected claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Regan (US 6,407,736) in view of Deering (US 2003/0122815) as applied to claim 1 above, and further in view of Van Hook et al (US 6,549,210). Applicant respectfully traverses the rejection. Claim 13 is dependent on claim 1, and is patentable for at least those reasons set forth above with respect to claim 1. Withdrawal of this rejection is requested.

Claims 16 and 17

In the Office Action, the Office rejected claims 16 and 17 under 35 U.S.C. § 103(a) as being unpatentable over Deering (US 2003/0122815) in view of Deering (US 2004/0100466). Applicant respectfully traverses the rejection to the extent such rejections may be considered applicable to the claims as amended. The applied references fail to disclose or suggest the inventions defined by Applicant's claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed invention.

With reference to independent claims 16, for example, the applied references lack any teaching that would have suggested a mobile communication device that includes a rendering

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engine that applies a direct evaluation algorithm to render a triangle for the graphical environment, wherein the direct evaluation algorithm applies a coefficient matrix defining a set of linear coefficients for a set of linear equations that describe edges of the triangle to pixels to render the triangle without interpolating between edges of the triangle. In fact, neither of the Deering references mentions application of a coefficient matrix to pixels to render a triangle at all.

For at least these reasons, the Office has failed to establish a prima facie case for non-patentability of Applicant's claims 16 and 17 under 35 U.S.C. § 103(a). Withdrawal of this rejection is requested.

New Claims

Applicant has added new claims 30 and 31 to the pending application. No new matter has been added by the new claims. Support for the new claims can be found throughout the present specification. The applied references fail to disclose or suggest the inventions defined by Applicant's new claims, and provide no teaching that would have suggested the desirability of modification to arrive at the claimed inventions.

As one example, the applied references fail to disclose or suggest computing a coefficient matrix for computing a set of linear coefficients of a set of linear equations that describe edges of the triangular area and applying the coefficient matrix to each of the pixels within a rectangular area to determine whether each of the pixels falls within the triangular area, as recited by new claim 31.

As described in detail above, the references (and particularly Regan) describe use of matrices to solve for coefficients for a z-plane equation and use of the z-plane equations to obtain z depth information at various points on the triangle. Col. 29, ll. 38-44 and 64-66. This is manifestly different than applying the coefficient matrix to the pixels to determine whether each of the pixels falls within the triangular area.

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Allowable Subject Matter

In the Office Action, the Office objected to claims 4, 8, 21 and 25 as including subject matter

that would be allowable if rewritten in independent form. The Applicant agrees with the

Office's conclusion.

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CONCLUSION

All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 17-0026. The Office is invited to telephone the below-signed attorney to discuss this application.

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